Hamidreza Almasi

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Research Interests

- Networked Systems
- Programmable Data Planes
- Data Center Networks
- Distributed Machine Learning Systems

Education

University of Illinois at Chicago, USA
PhD Student, Computer Science aug. 2017–present
- CGPA: 4.00/4.00;

Sharif University of Technology, Tehran, Iran
Master of Science, Computer Engineering sept. 2013–dec. 2015
- Major in Information Technology Engineering
- CGPA: 3.80/4.00 (17.82/20); Computer Networks Specialization
- Selected Coursework: Advanced Computer Networks (A+), Complex Dynamical Networks (A+), Wireless Networking (A+), Modeling and Analysis of Computer Networks (A+), Advanced Network Security (A)

University of Tehran, Tehran, Iran
Bachelor of Science, Electrical and Computer Engineering sept. 2008–june 2013
- CGPA: 3.24/4.00; Major in Information Technology Engineering
- Last 5 Semesters (Major) GPA: 3.61/4.00 (16.88/20)
- Selected Coursework: Computer Networks (A+), Internet Engineering (A+), Operating Systems Lab (A+), Computer Networks Security (A), Operating Systems (A), Intelligent Systems (A), MultiAgent Systems (A)

Software Proficiencies

- Languages: C/C++, Python, Verilog, $P4_{14}$ and $P4_{16}$ (Barefoot Academy, BA-101)
- Network Tools: Mininet, Ryu, NetworkX, ns-3, OPNET, Wireshark
- Web/DB Technologies: HTML/CSS, JavaScript, PHP, ASP.NET, MySQL
- Misc.: Git, LaTeX, Matlab, Office, ModelSim, Quartus, Visual Studio, Eclipse, NetBeans

Publications

- Stephens B. E., Grassi, D., **Almasi, H.,** Ji, T., Vamanan, B., Akella A. *TCP is Harmful to In-Network Computing: Designing a Message-Oriented Transport Protocol (MTP)*. ACM HotNets 2021, University of Illinois at Chicago, USA.
- Rezaei, H., **Almasi, H.,** Vamanan, B. *Smartbuf: An Agile Memory Management for Shared-Memory Switches in Datacenters*. IEEE IWQoS 2021, University of Illinois at Chicago, USA.
- **Almasi, H.,** Rezaei, H., Chaudhry, M.U., Vamanan, B. *Pulser: Fast Congestion Response using Explicit Incast Notifications for Datacenter Networks*. IEEE LANMAN 2019, University of Illinois at Chicago, USA.
- Rezaei, H., Chaudhry, M.U., **Almasi, H.,** Vamanan, B. *ICON: Incast Congestion Control using Packet Pacing in Datacenter Networks*. COMSNETS 2019, University of Illinois at Chicago, USA.
- **Almasi, H.,** Ajorloo, H. *A Framework for Application-aware Networking by Delegating Traffic Management of SDNs*. Technical Report, Sharif University of Technology, Tehran, Iran.

Research Experience

BITS Networked Systems Laboratory, University of Illinois at Chicago, USA
Graduate Research Assistant 2017–present
Working on:
- A new offload-friendly message-oriented transport protocol
- Proactive congestion control mechanisms using programmable data planes
- Alleviating incast congestion collapse in low latency datacenter networks

Network Architectures and Protocols Lab, Sharif University of Technology, Tehran, Iran
Graduate Research Assistant 2014–2015
- Worked towards application control of SDNs where certain end host applications could benefit more from network resources because they better know their requirements and thus could use an API to directly communicate with controller for their requests

Center for Wireless Multimedia Communications, University of Tehran, Tehran, Iran
Undergraduate Research Assistant 2013
- Designed and implemented an Android application for adaptive English vocabulary learning system based on item response theory (IRT)
- Deployed an Apache Axis web service to communicate with client applications through text messages in order to gather relevant statistics

Teaching Experience

University of Illinois at Chicago, USA
Graduate Teaching Assistant, Computer Science Department 2018-present
- Data Structures (CS 251), Introduction to Networking (CS 450), Database Systems (CS 480)

Sharif University of Technology, Tehran, Iran
Graduate Teaching Assistant, Computer Engineering Department 2014–2015
- Computer Networks (CE 443), Software Defined Networking (CE 874), Wireless Networking (CE 628), Advanced Computer Networks (CE 693), Data Transmission (CE 343)

Selected Projects

University of Illinois at Chicago

▷ **UIC Translab** Summer 2020
– Visualized the Agent-based Dynamic Activity Planning and Travel Scheduling (ADAPTS) network simulator outputs using Processing

▷ **Advanced Computer Networks** Spring 2020
– Formal specification and testing of network protocols such as IP, UDP, TCP using IVy

▷ **Data Center Networking** Fall 2019
– Axon Routing in P4: Implemented bi-directional multi-hop routing which correctly handles invalid packets.
– Learning and Benchmarking RDMA: Used a simple RDMA program that sets up memory regions and queue pairs and sends a single verb to benchmark the performance of a single CPU thread sending different size segments/verbs in CloudLab.
– NFV and Virtual Switching: Benchmarking different DPDK-based network functions using openNetVM in CloudLab.

▷ **Data Mining & Text Mining** Fall 2018
– Aspect Based Sentiment Analysis: Used a window-based technique that selects the k-nearest words in both directions of the aspect and tried SVM, Naïve Bayes, Decision Tree, and Neural Network models.

▷ **Advanced Computer Networking** Spring 2018
– Variation Aware Load Balancing in Datacenter Networks: Improvements over CONGA for higher percentile flow completion times by selecting paths that minimize maximum one-way trip-time.

Sharif University of Technology

▷ **Advanced Network Security**
– Implemented a customized port scanning script and compared its results to those from Nmap and Hping3.
– Wrote bash and AWK scripts to analyze network activities of Slammer worm in a pcap file.
– Emulated FTP and SSH services on a Honeyd virtual host and used masquerading iptables rules to forward corresponding requests to it.
– Analyzed traffic of a user and used network forensics to find the captcha shown to him in a visit to a captcha protected website.

▷ **Complex Dynamical Networks**
– Compared resiliency between random (Watts-Strogatz) and small-world, scale-free (Barabasi-Albert) networks by analyzing global efficiency and giant components measures on different types of edge removals.
– Implemented and compared Linear Threshold and Independent Cascade diffusion models.
– Simulated synchronization of chaos in a network of coupled dynamical systems

▷ **Advanced Computer Networks**
- Simulated TCP behavior in Slow Start, Congestion Avoidance, Fast Retransmission and Fast Recovery scenarios plus the effect of WFQ policy using OpNet.
- Statistical analysis on an Internet traffic measurement trace of Netflow records.
- Analyzing BGP stability and convergence behavior based on update messages logged by RouteViews.

Professional Experience

Sarmad ICT, Tehran, Iran
iOS Mobile Application Developer JUNE 2017-AUG 2017
- Developed a mobile application for management of apartment complexes

Aseman Intelligent Systems Development Company, Tehran, Iran
Technical Expert DEC. 2015-MAR. 2016
- Developed a technical master plan for national IPTV/OTT service deployment

Towzin Electric Corp., Tehran, Iran
Network Administrator 2009–2013
- Maintained a network of more than 200 end hosts and 15 application servers with geographically distributed sites throughout the country

Service

Artifact Evaluation Committee
- ACM SOSP 2021

Journal Review
- Journal of High Speed Networks 2020

Program Committee
- ACM IMC Shadow PC 2019

Organizer
- IEEE ICNP 2019

Honors & Awards

- Won ACM SIGMETRICS/IFIP PERFORMANCE 2019 **NSF travel grant** 2019
- Won NSDI 2018 **NSF travel grant** 2018
- Won Peter and Deborah Wexler Graduate Student Award **Scholarship** 2017
- Ranked in **top 20%** of class, Sharif University of Technology 2013-2015
- Won ECOOP 2015 NetPL **NSF travel grant** 2015
- **Ranked 13th** among over 33,000 participants of IT Engineering M.Sc. university entrance examination 2013
- Ranked in **top 20%** of class, University of Tehran 2008-2013
- Ranked in **top 0.5%** among over 320,000 participants in undergraduate university entrance examination 2008
- Admitted to and graduated **with highest honors** from National Organization for Development of Exceptional Talents (NODET), Diploma GPA: **19.61/20** 2004-2008